

A Dictionary of Concepts in NMR (Revised Edition); by S.W. Homans, Oxford University Press; Oxford, 1992; vii + 372 pages. £ 17.50 (paperback).

High resolution NMR spectroscopy has had an enormous impact in many fields in the last eighteen years, in particular in the area of structural determination of biological and chemical molecules, this impact being due predominantly to the advent of multi-dimensional NMR. With the ever-increasing number of experimental techniques, sophistication of spectrometers and the increasing number of disciplines using this method, it is necessary to have convenient access to definitions of NMR terminology and to concise explanations of concepts covering both theoretical and practical aspects. A greater understanding of how and why certain experiments work would allow users to improve existing techniques, create new ones and analyze why experiments fail; this is important both to the spectroscopist and to those using modern NMR methods as a tool in their particular area(s) of interest. A lack of clear understanding of the method (in both practical and theoretical terms) can lead to an under-utilization of expensive equipment, wastage of time and materials, together with frustration and misinterpretation of data.

Steve Homans has tried to address the need for an NMR 'dictionary' with the biochemist and chemist in mind. This book attempts to give a theoretical explanation of many of the basic concepts used in modern NMR techniques, such as density matrices, quantum mechanics, product operators, coherence transfer pathways, and relaxation. In addition, the practical aspects of an NMR experiment, such as parts of the spectrometer, field-frequency locks, lincshapes, signal-to-noise ratios, quadrature detection, etc., are all discussed in some detail. Attempts are made to give a theoretical analysis of many of the different types of experiments. The book contains a large number of useful equations and basic mathematical principles. The coverage is very comprehensive, with the revised edition containing aspects of three-dimensional NMR.

Although it must be borne in mind that this is meant to be a dictionary, and hence is constrained by space and by the fact that each concept definition must be self-contained, there are aspects of the book that could have been improved upon in order to make

it more readable. Because the concepts are inter-related, it is not possible to define each strictly in isolation; poor cross-referencing and definitions not placed in their correct context have made the text fragmented, with the readers finding it difficult to correlate various concepts. For example, two-dimensional NMR should have been explained additionally in the context of coherence transfer pathways, quantum coherence, density matrices and/or product operators and phase cycling; all these five concepts have been explained in isolation but not mentioned at all in the discussion on two-dimensional NMR.

There is some lack of consistency. Related concepts are explained using both the classical and quantum mechanics theories, thereby making similar experiments appear completely different. It would perhaps have been more beneficial to draw initially a relationship between the classical and quantum mechanics theory and then to use the latter to describe a particular set of experiments. This approach would have helped to avoid much repetition and multiple definitions of similar concepts. Inconsistencies are also found in the use of terms; for example, the population states at thermal equilibrium are represented in at least three different ways. Many definitions of terms could have been more precise. Finally, we feel that the lack of useful diagrams has made certain of the entries unnecessarily protracted and complicated.

This is a good book for more-experienced users of NMR who understand the fundamentals and want a quick reference to refresh their memory. It contains a very comprehensive coverage of modern NMR concepts and techniques. On the other hand, for those who want a clear and more detailed explanation of concepts, it is recommended that this book be used in conjunction with others, such as Andy Derome's "Modern NMR Techniques for Chemistry Research" and Ray Freeman's "A Handbook of Nuclear Magnetic Resonance".

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Booklist No. 111

January 1993

Abbott, N.J. (ed.) Glial-neuronal interaction. From a conference, Cambridge, UK, Sep. 1990. Annals of the New York Academy of Sciences, vol. 633. New York Academy of Sciences; New York, 1991. xxii + 639 pp. \$ 154.00.

Aggarwal, B.B. and Gutterman, J.V. (eds.) Human cytokines. Handbook for basic and clinical research. Blackwell Scientific; Cambridge, MA, 1992. xvi + 441 pp. \$ 49.95.

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Bender, D.A. Nutritional biochemistry of the vitamins. Cambridge

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Ben-Naim, A. Statistical thermodynamics for chemists and biochemists. Plenum; New York, 1992. xviii + 697 pp. \$ 85.00.

Berger, J.R. et al. (eds) AIDS 91 summary: a practical synopsis of the VII International Conference. Philadelphia Sciences Group; 11232 Midlothian Turnpike, Suite 325, Richmond, Virginia 23235-9620 USA, 1992. 350 pp. \$ 85.00 (pbk). Reviewed in: Nature, 8 Oct. 1992, 359, 491 by R. Vile.

Block, T.M. et al. (eds) Innovations in antiviral development and the detection of virus infections. From a symposium, Philadelphia, PA,

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- Bobaire, B. (ed.) *The male germ cell. Spermatogonium to fertilization. From a workshop, Montreal, Quebec, Apr. 1991. Annals of the New York Academy of Sciences*, vol. 637. New York Academy of Sciences; New York, 1991. xii + 510 pp. \$ 106.00.
- Botre, F., Gros, G. and Storey, B.T. (eds) *Carbonic anhydrase: from biochemistry and genetics to physiology and clinical medicine*. VCH; Weinheim, 1991. xvi + 467 pp. DM 186.00; £ 70.00. Reviewed in: *FEBS Lett.*, 20 July 1992, 306, 277 by N. Carter.
- Bryce, C.F.A. (ed.) *Microcomputers in biochemistry*. IRL Press; New York, 1992. xx + 307 pp. £ 19.50. Reviewed in: *Trends Biochem.*, Nov. 1992, 17, 479 by J.M.
- Chadwick, D.J. and Widdows, K. *Protein conformation. Ciba Foundation symposium no. 161*. Wiley; Chichester, 1991. xii + 269 pp. £ 39.50. Reviewed in: *FEBS Lett.*, 20 July 1992, 306, by A. North.
- Chen, L.C. et al. (eds.) *AIDS and women's reproductive health. From a workshop, Bellagio, Italy, Oct. 1990. Plenum; New York, 1992. viii + 208 pp.* \$ 65.00.
- Cochrane, C.G. and Gimbrone Jr., M.A. (eds.) *Cellular and molecular mechanisms of inflammation, vol. 3. Signal transduction in inflammatory cells, part A*. Academic Press; San Diego, CA, 1992. x + 207 pp. \$ 49.95.
- Driscoll, P. (ed.) *Genetically defined animal models of neurobehavioral dysfunctions*. Birkhäuser Boston; Cambridge, MA, 1992. xx + 304 pp. \$ 94.50.
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- Eigen, M. *Steps toward life: a perspective on evolution*. Oxford University Press; Oxford, New York, 1992. 173 pp. £ 16.95; \$ 29.95. Reviewed in: *Nature*, 15 Oct. 1992, 359, 597 by N. Lehman.
- Eisenthal, R. and Danson, M.J. (eds.) *Enzyme assays*. IRL Press; New York, 1992. xxiv + 351 pp. £ 25.00. Reviewed in: *Trends Biochem.*, Nov. 1992, 17, 479 by J.M.
- Faglia, G. et al. (eds.) *Pituitary adenomas. New trends in basic and clinical research. From a workshop, Venice, Mar. 1991. International Congress series, no. 961. Excerpta Medica; Amsterdam and Elsevier Science; New York, 1991. x + 395 pp.* \$ 125.50.
- Fedoroff, S. and Richardson, A. (eds.) *Protocols for neural cell culture. Humana; Totowa, NJ, 1992. xiv + 178 pp.* \$ 49.50.
- Flatt, P.R. (ed.) *Nutrient regulation of insulin secretion*. Portland Press; London, 1992. xi + 415 pp. £ 60.00.
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- Fujiki, N. and Macer, D.R.J. (eds.) *Human genome research and society. From a seminar, Fukui, Japan, Mar. 1992. Eubios Ethics Institute; Christchurch, New Zealand, 1992. xii + 227 pp.* \$ 20.00.
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- Gomez-Fernandez, J.C., Chapman, D. and Packer, L. (eds.) *Progress in membrane biotechnology*. Birkhäuser; Basel, Berlin, 1991. viii + 340 pp. DM 118.00; SFr 98.00. Reviewed in: *FEBS Lett.*, 20 July 1992, 306, 278 by H. Wiseman.
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Parker, M.G. (ed.) *Growth regulation by nuclear hormone receptors. Cancer surveys*, vol. 14. Cold Spring Harbor Laboratory Press; Cold Spring Harbor, NY, 1992. viii + 244 pp. \$ 66.00.

Perutz, M. *Protein structure: new approaches to disease and therapy*. W.H. Freeman; London, New York, 1992. 326 pp. \$ 39.95; £ 32.95 (hbk). \$ 29.95; £ 21.95 (pbk). Reviewed in: *Nature*, 19 Nov. 1992, 360, 218 by T. Blundell.

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Ptashne, M. (ed.) *A genetic switch. Phage λ and higher organisms*, 2nd edn. Cell Press; Cambridge, MA and Blackwell Scientific; Cambridge, MA, 1992. x + 122 pp. \$ 26.95.

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No. 96 (August, 1990) *FEBS Lett.* 268, 438–440.
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Wong-Staal, F. et al. (eds.) *AIDS 1991: a year in review. Current Science*; London, 1992. 270 pp. £ 35.00; \$ 59.00. Reviewed in: *Nature*, 8 Oct. 1992, 359, 491 by R. Vile.

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